

WHAT IS CLAIMED IS:

1. Radio communications apparatus comprising:

5 a quadrature modulator for making the transition of the
phase of a modulated wave via a in-phase component and a
quadrature component;

a first voltage-controlled oscillator for outputting a
first transmission signal;

a second voltage-controlled oscillator;

10 a first mixer for frequency-converting the first
transmission signal based on the output signal of the second
voltage-controlled oscillator;

15 a phase comparator for comparing the phase of the output
signal of the quadrature modulator with the phase of the output
signal of the first mixer;

a low-pass filter for filtering the component below a
predetermined frequency of the output signal of the phase
comparator and supplying the resulting signal to the frequency
control terminal of the first voltage-controlled oscillator;

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a first band-pass filter for outputting a signal obtained
by filtering the component in a predetermined frequency band
of the output signal of the quadrature modulator as a second
transmission signal.

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2. Radio communications apparatus according to claim 1, further comprising:

a third voltage-controlled oscillator;

a second mixer for frequency-converting the output signal of the first band-pass filter based on the output signal of the third voltage-controlled oscillator; and

a second band-pass filter for outputting a signal obtained by filtering the component in a predetermined frequency band of the output signal of the second mixer as a second transmission signal.

3. Radio communications apparatus according to claim 1, further comprising:

a second mixer for frequency-converting the output signal of said first band-pass filter based on the output signal of the second voltage-controlled oscillator; and

a second band-pass filter for outputting a signal obtained by filtering the component in a predetermined frequency band of the output signal of the second mixer as a second transmission signal.

4. Radio communications apparatus according to claim 1, further comprising:

a first transmitter for amplifying a first transmission signal output from the first voltage-controlled oscillator and

transmitting the resulting signal via an antenna; and

a second transmitter for amplifying a second transmission signal output from the first band-pass filter and transmitting the resulting signal via an antenna.

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5. Radio communications apparatus according to claim 2, further comprising:

a first transmitter for amplifying a first transmission signal output from the first voltage-controlled oscillator and transmitting the resulting signal via an antenna; and

a second transmitter for amplifying a second transmission signal output from the second band-pass filter and transmitting the resulting signal via an antenna.

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6. Radio communications apparatus according to claim 3, further comprising:

a first transmitter for amplifying a first transmission signal output from the first voltage-controlled oscillator and transmitting the resulting signal via an antenna; and

a second transmitter for amplifying a second transmission signal output from the second band-pass filter and transmitting the resulting signal via an antenna.

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